

**ABSTRACT OF THE DISCLOSURE**

A motion video signal encoder maximizes image quality without exceeding transmission bandwidth available to carry the encoded motion video signal by comparing encoded frames of the motion video signal to a desired size of frame. If the size of encoded frames differ from the desired size, quantization is adjusted to produce encoded frames closer in size to the desired size. In addition, a cumulative bandwidth balance records an accumulated amount of available bandwidth. The cumulative bandwidth balance is adjusted as time elapses to add to the available bandwidth and as each frame is encoded to thereby consume bandwidth. If the cumulative bandwidth balance deviates from a predetermined range, quantization is adjusted as needed to either improve image quality to more completely consume available bandwidth or to reduce image quality to thereby consume less bandwidth. Rapid changes in the amount of change or motion in the motion video signal are detected by comparing the amount of change between two consecutive frames and the amount of change between the next two consecutive frames. Quantization is precompensated according to the measured rapid change. Conditional replenishment is improved by dividing macroblocks into quadrants and measuring differences between corresponding quadrants of macroblocks. As a result, sensitivity to changes along edges and corners of macroblocks is increased. In addition, sensitivity to changes in a particular macroblock is increased when an adjacent macroblock contains sufficient change to be encoded and therefore not a candidate for conditional replenishment.